

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (previously presented) A nuclear power plant system comprising:  
a nuclear reactor;  
a steam turbine that uses steam generated in a pressure vessel included in the nuclear reactor; and  
a radioactive material separating and removing apparatus placed in the pressure vessel or in a steam passage extended between the pressure vessel and an inlet of the steam turbine and having a surface adapted to trap thereon radioactive corrosion products contained in a plurality of water drops so that the radioactive corrosion products firmly adhere on the surface, in order to separate and remove the radioactive corrosion products from the plurality of water drops.
2. (original) The nuclear power plant system according to claim 1, wherein the radioactive material separating and removing apparatus has a high-temperature water purifying apparatus employing a metal or a metal oxide, which is stable in an environment in which high-temperature water or high-temperature steam exists, as an ion-exchange material that exchanges ions for radioactive ions.
3. (previously presented) The nuclear power plant system according to claim 1, wherein the radioactive material separating and removing apparatus includes a high-temperature water purifying apparatus employing a superhydrophilic substance capable of trapping water drops as purifying means to purify water.
4. (previously presented) A nuclear power plant system comprising:  
a nuclear reactor;  
a steam turbine that uses steam generated in a pressure vessel included in the nuclear reactor; and

a radioactive material separating and removing apparatus placed in a reactor water system attached to the nuclear reactor, the pressure vessel or a steam passage extended between the pressure vessel and an inlet of the steam turbine and employing a metal or a metal oxide, which is stable in an environment in which high-temperature water or high-temperature steam exists, as an ion-exchange material adapted to exchange ions for radioactive ions to trap the radioactive ions on or in the apparatus.

5. (previously presented) The nuclear power plant system according to claim 26, wherein the ion-exchange material is  $\text{TiO}_2$  or  $\text{ZrO}_2$ .

6. (original) The nuclear power plant system according to claim 5, wherein the ion-exchange material is formed in fiber.

7. (previously presented) The nuclear power plant system according to claim 26, wherein the ion-exchange material is ferrite.

8. (previously presented) The nuclear power plant system according to claim 26, wherein

surfaces of the corrugated plates include a coating containing  $\text{TiO}_2$  as the ion-exchange material and  $\text{SiO}_2$ .

9. (previously presented) The nuclear power plant system according to claim 26, wherein each of the corrugated plates includes thereon a p-type oxide film and the ion-exchanging material is a coating on the p-type oxide film, and wherein the ion-exchange material is  $\text{TiO}_2$  which is an n-type oxide.

10. (previously presented) The nuclear power plant system according to claim 26, wherein the dryer is provided with a means for creating an electric field or a magnetic field between adjacent corrugated plates, adapted so that minute radioactive particles contained in the multiphase flow are biased toward the corrugated plates by the electric field or the magnetic field.

11. (previously presented) The nuclear power plant system according to claim 10, wherein the means for creating an electric field or a magnetic field comprises a photocell including:

an n-type semiconductor, which is  $\text{TiO}_2$  or  $\text{ZrO}_2$ , and is the ion-exchange material, deposited on the corrugated plates; and

a film of a corrosion product, which is a p-type semiconductor, produced by a corrosion of surfaces of the corrugated plates.

12. (cancelled)

13. (previously presented) The nuclear power plant system according to claim 4, wherein the radioactive separating and removing apparatus comprises:

a vessel;

a hollow membrane pipe disposed in the vessel; and

filter aid particles arranged in any one of the following manners in which:

the particles are held on an outer circumference of the hollow membrane pipe;

the particles are coated on an outer circumferences of the hollow membrane pipe; and

the particles are floating about an outer circumferences of the hollow membrane pipe,

wherein the filter aid particles comprise a metal or a metal oxide, which is stable in an environment where high-temperature water or steam exists and is capable of exchanging ions for radioactive ions.

14. (original) The nuclear power plant system according to claim 13, wherein the hollow membrane pipe has porous structures, and diameters of pores in an outer part of the hollow membrane pipe are smaller than those of pores in an inner part of the hollow membrane pipe.

15. (cancelled)

16. (previously presented) The nuclear power plant system according to claim 13, wherein the filter aid particles comprise:

a ferrite;  
oxides containing  $\text{TiO}_2$  or  $\text{ZrO}_2$  as a principal component; or  
a metal or a composite material, for producing the oxide or the oxides, which contains Fe, Ni, Ti or Zr as a principal element.

17. (previously presented) The nuclear power plant system according to claim 13, wherein the hollow membrane pipe is formed of:

oxides containing nickel ferrite ( $\text{NiFe}_2\text{O}_4$ ),  $\text{TiO}_2$  or  $\text{ZrO}_2$ , as principal components; or  
a metal or a composite material, for producing the oxide or the oxides, which contains Fe, Ni, Ti or Zr as a principal element.

18. (previously presented) The nuclear power plant system according to claim 4 further comprising a filter that reduces an iron concentration of water to 0.1 ppb or below to suppress an increase in differential pressure in the radioactive separating and removing apparatus due to deposition of particles of corrosion products.

19. (cancelled)

20. (cancelled)

21. (cancelled)

22. (cancelled)

23. (cancelled)

24. (previously presented) The nuclear power plant system according to claim 4, wherein the metal or metal oxide is located on a surface, wherein the surface is adapted to trap thereon radioactive ions by exchanging ions associated with the metal or metal oxide with radioactive ions.

25. (previously presented) The nuclear power plant system according to claim 4, wherein the metal or metal oxide is located on a surface, and wherein the surface is adapted to exchange ions associated with the metal or metal oxide with radioactive ions so that the radioactive ions are trapped with the metal or metal oxide.

26. (previously presented) A nuclear power plant system comprising:

a nuclear reactor having a pressure vessel which generates steam therein;

a steam turbine that uses the steam generated by the nuclear reactor; and

a dryer arranged in the pressure vessel to dry the steam to be supplied to the steam turbine, the dryer including a plurality of corrugated plates defining therebetween passages through which a multiphase flow containing the steam, water drops and radioactive substances flows, the corrugated plates including thereon an ion-exchange material adapted to exchange ions for radioactive ions.

27. (previously presented) The nuclear power plant system according to claim 26, wherein the ion-exchange material is a superhydrophilic material.

28. (new) A nuclear power plant system comprising:

a nuclear reactor;

a steam turbine that uses steam generated in a pressure vessel included in the nuclear reactor; and

a radioactive material separating and removing apparatus placed on corrugated plates of a dryer arranged in the pressure vessel, or placed in a steam passage extended between the pressure vessel and an inlet of the steam turbine, the radioactive material separating and removing apparatus including a surface having superhigh hydrophilic TiO<sub>2</sub> and adapted to trap thereon radioactive corrosion products contained in a plurality of water drops so that the radioactive corrosion products firmly adhere on the surface, in order to separate and remove

radioactive corrosion products from plurality of water drops.

29. (new) A nuclear power plant system comprising:

a nuclear reactor having a pressure vessel which generates steam therein;

a steam turbine that uses the steam generated by the nuclear reactor; and

a dryer arranged in the pressure vessel to dry the steam to be supplied to the steam turbine, the dryer having a plurality of corrugated plates defining therebetween passages through which a multiphase flow containing the steam, water drops and radioactive substances flows, wherein the corrugated plates have surfaces having superhigh hydrophilic TiO<sub>2</sub>.

30. (new) The nuclear power plant system according to claim 29, wherein the superhigh hydrophilic TiO<sub>2</sub> is formed in fiber.

31. (new) The nuclear power plant system according to claim 29, wherein the surface of the corrugated plates are coated with a coating containing TiO<sub>2</sub> and SiO<sub>2</sub>.

32. (new) The nuclear power plant system according to claim 29, wherein each of the corrugated plates includes thereon a p-type oxide film and the superhigh hydrophilic TiO<sub>2</sub> is a coating on the p-type oxide film, and wherein the superhigh hydrophilic TiO<sub>2</sub> is an n-type oxide.

33. (new) The nuclear power plant system according to claim 29, wherein the dryer is provided with a means for creating an electric field or a magnetic field between

adjacent corrugated plates, adapted so that minute radioactive particles contained in the multiphase flow are biased toward the corrugated plates by the electric field or the magnetic field.

34. (new) The nuclear power plant system according to claim 33, wherein the means for creating an electric field or a magnetic field comprises a photocell including:

the n-type semiconductor, which is the superhigh hydrophilic TiO<sub>2</sub> deposited on the corrugated plates; and

a film of a corrosion product, which is a p-type semiconductor, produced by a corrosion of surfaces of the corrugated plates.